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ABSTRACT

This paper is an exposition and comparison of the objectives, methodology, and findings of two research projects entitled "An Occupational Analysis of Training in Industry" and "An Occupational Analysis of the Work of Beginning Teachers." The relevance of these studies to the design and evaluation of teacher education curriculum and the practicum is emphasized, and reasons for using the Time-Spent Task Inventory approach are discussed. Using the CODAP system of computer programs, results of the analysis of trainers' work are outlined. Duty and task job descriptions are given and their implications for curriculum design and evaluation discussed. The trainer grouping process is explained, and groups are identified and described with duty and task job descriptions being provided, as well as a wide range of background detail. The methodology of this study is compared with that used in the "Occupational Analysis of Teaching: The Work of the Beginning Teachers," and the implications for the design of train-the-trainer and teacher education programs are discussed. Seventeen figures are included to display report data. (Author/JMK)

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TRAINERS IN INDUSTRY

AND

TEACHERS IN SCHOOLS:

A Comparative Analysis of Two Teaching Professions

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CONTENTS

LIST OF FIGURES

1. ABSTRACT

2. FUNDAMENTAL QUESTIONS.

3. THE NEED FOR AN OCCUPATIONAL ANALYSIS OF TRAINING AND TEACHING.

4. FUNCTIONS OF OCCUPATIONAL ANALYSIS

5. OBJECTIVES

6. OVERVIEW OF OCCUPATIONAL ANALYSIS METHODOLOGY.

8. FUNCTIONS AND ADVANTAGES OF TASK INVENTORY.

12. EMPIRICAL BASIS OF 'TIME SPENT' SCALE.

13. USE OF 'TIME SPENT' AND 'TASKS PERFORMED' PROGRAMS.

15. DUTY JOB DESCRIPTION FOR TRAINERS.

19. TASK JOB DESCRIPTION FOR TRAINERS.

22. CLUSTERING PROCESS AND DIAGRAM.

26. JOB TYPES IN TRAINING.

28. JOB TYPES - JOB DESCRIPTIONS - DUTIES.

30. JOB TYPES - OUTSTANDING FEATURES.

31. JOB TYPES - GROUP PROFILE.

36. SIMILARITIES AND DIFFERENCES - TRAINERS AND TEACHERS.

37. JOB TYPES WITHIN THE OCCUPATION.

38. RANGE OF QUALIFICATIONS.

39. HIERARCHICAL DIFFERENCES WITHIN EACH PROFESSION.

40. DIFFERENCES IN "CLIENTS".

41. RECOMMENDATIONS FOR ACTION.

42. RECOMMENDATIONS FOR RESEARCH.

43. TERMS USED IN OCCUPATIONAL ANALYSIS.

45. BIBLIOGRAPHY.

LIST OF FIGURES

1. Summary of Training and Development Roles.

2. Analyse Training Needs - Duty and Tasks.

3. Summary of Teaching Duties and Tasks in Student Teaching Practice.

4. Duty Job Description of Trainers.

5. Top Three Duties of Trainers.

6. Task Job Description of Trainers.

7. Number of Tasks in Top 25% of Time Spent.

8. DIAGRAM printout.

9. Extract from DIAGRAM.

10. Job-Types Diagram.

11. Five Job-Types.

12. Outstanding Features of Each Job-Type.

13. Group Profiles.

14. Group 5 - Task Job Description.

15. Group 63 - Task Job Description.

16. Differences between Group 5 and Group 110 Task Profiles.

17. Differences between Group 63 and Group 110 Task Profiles.

ABSTRACT

This is an exposition and comparison of the objectives, methodology and findings in two research projects:

1. AN OCCUPATIONAL ANALYSIS OF TRAINING IN INDUSTRY, and
2. AN OCCUPATIONAL ANALYSIS OF THE WORK OF BEGINNING TEACHERS.

The relevance of these studies to the design and evaluation of Teacher Education curriculum and the Practicum will be emphasised.

The reasons for using the TIME-SPENT TASK INVENTORY approach are discussed.

The results of the analysis of the work of trainers, using the CODAP system of computer programs, are outlined. Duty and task job descriptions of the entire sample are presented and their implications for curriculum design and evaluation are discussed.

The process of grouping the trainers with the clustering program is explained and the resulting groups are identified and described. Duty and task job descriptions are provided for each group.

A wide range of background data is presented for each group as an aid to labelling the job groups.

Finally, the methodology and findings of this study are compared with those in the OCCUPATIONAL ANALYSIS OF TEACHING: THE WORK OF BEGINNING TEACHERS, and the implications for the design of train-the-trainer and teacher education programs are discussed.

SOME FUNDAMENTAL OCCUPATIONAL ANALYSIS QUESTIONS

1. What do trainers do?

2. What do sub-groups of trainers do?

3. What is the appropriate curriculum for each sub-group of trainers?

The Task Inventory method of Occupational Analysis is designed to answer fundamental questions which are of interest both to the employers in an occupation and those who provide the educational and training programs for that occupation.

Employers need accurate and detailed job descriptions to enable them to match people and jobs harmoniously and effectively. Designers and evaluators of training programs for the occupation also need accurate and specific job descriptions in order to design well-sequenced, job-relevant curricula.

NEED FOR AN OCCUPATIONAL ANALYSIS OF TEACHING

The sections of the teacher education curriculum which is most praised by student teachers and classroom teachers is the teaching practice program. The theoretical sections of the curriculum tend to attract more criticism. The general thrust of the criticism is that the programs are not as relevant to the changing and complex worlds of the school and classroom as they could be. Recent inquiries into the state of teacher education are replete with such criticisms. In a bid to improve the match between the teacher preparation program and the work of teachers, the National Inquiry into Teacher Education recommended that.

> "Each period of practical experience should be planned as part of an ordered and sequential teaching practice program culminating in the student experiencing the full range of duties and tasks allotted to the beginning teacher."

The material on the work of teachers appears in considerable detail in the papers listed in the attached bibliography.

NEED FOR AN OCCUPATIONAL ANALYSIS OF TRAINING

> "Research is needed into the actual work performed by people in the field of training and development. It is clear that there are several levels in the training and development occupation, but there is little agreement either on their number or their job descriptions. By using occupational analysis research techniques, it would be possible to describe the tasks and duties performed at each level. These job profiles could then be used for the evaluation and re-design of the complete range of programs which provide education and training for the training and development profession."
>
> (Comments on the Brisbane Conference of the Australian Association of Training and Development.)

Some of the results of the research project, An Occupational Analysis of Training in Industry, are outlined in this paper. A full report is being written for the National Training Council which funded the project.

FUNCTIONS OF OCCUPATIONAL ANALYSIS:

1. To identify the tasks performed by members of a particular occupation.

This is done by surveying the actual performers of these tasks.

2. To provide information on the variation of tasks performed in different settings in that occupation.

e.g. Government v private industry;
small v large undertakings;
higher v lower levels in the occupation.

3. To develop an instrument for the preparation and evaluation of curricula for the occupation.

Task-based data can provide accurate and up-to-date information for the selection and organisation of the objectives, content and evaluation procedures for job-related curricula.

4. To supply employers, training institutions and members of the labour force with a list of tasks which they can readily assess for person/job matching.

OBJECTIVES

The objectives of this survey of the work of trainers are to:

1. Identify and validate a list of the duties and tasks performed by trainers and developers in industry.

2. Ascertain the relative percentage of work time spent on these duties and tasks by trainers and developers.

3. Identify the job-types which exist within the training and development profession.

4. Indentify the duties and tasks performed by each job-type, and the relative percentage of time spent on each duty and task.

5. Indentify the duties and tasks which differentiate one job-type from another.

6. Provide information for the design and evaluation of train-the-trainer programs.

The objectives for the surveys of the work of teachers were similar to these. They are given in detail in the papers listed in the bibliography on the occupational analysis of teaching. (Burns, 1980 and 1981.)

OVERVIEW OF OCCUPATIONAL ANALYSIS METHODOLOGY

1. CREATE a TASK INVENTORY which lists for the occupation :

all major roles;
all duties;
all tasks.

2. ASK each member of the occupation being surveyed to complete the task inventory by :

checking off all the tasks which he performs in his present position;

using the rating scale to estimate the time spent on each task relative to the time spent on other tasks;

supplying relevant background data.

3. USE the COMPREHENSIVE OCCUPATIONAL DATA ANALYSIS PROGRAMS (CODAP) to :

calculate the PERCENTAGE of the survey group who perform each TASK;

calculate the RELATIVE PER CENT OF TIME SPENT ON EACH TASK;

create a TASK JOB DESCRIPTION which lists all the TASK, the PER CENT PERFORMING each task, and the RELATIVE PER CENT TIME SPENT on each TASK.

create a DUTY JOB DESCRIPTION which lists all the DUTIES, the PER CENT PERFORMING EACH DUTY, and the RELATIVE PER CENT TIME SPENT on each DUTY.

5. USE the CLUSTERING PROGRAM to group respondents according to the degree of similarity in their job descriptions. This grouping process results in the identification of significant JOB-TYPES in the occupation.

6. USE CODAP to create a DUTY JOB DESCRIPTION and a TASK JOB DESCRIPTION for each JOB-TYPE.

7. Use the CODAP GROUP DIFFERENCES program to describe the differences between pairs of job-types according to tasks performed and relative time spent on each task.

8. Create duty and task profiles for each of the job-types in the group which include complete duty and task job descriptions and identify the duties, tasks and background data which differentiate one groups from the other.

9. Provides the job profiles to evaluators and designers of curricula for the occupation.

FUNCTIONS AND ADVANTAGES OF THE TASK INVENTORY

A Task Inventory was constructed which covered all the roles, duties and tasks of people working in training and development. It was designed to encompass the range of training work performed from instructor through to senior management training level. The inventory enabled each respondent to indicate all the tasks he performed, including those which may have been above or below his level of reponsibility. The inventory contained five roles, divided into fourteen duties, which were in turn divided into 131 task statements. These are shown in Figure 1.

FIGURE 1

SUMMARY OF TRAINING AND DEVELOPMENT ROLES

I. PLANNING AND PREPARATION -INDIVIDUAL TRAINING AND DEVELOPMENT PROGRAM

- A. ANALYZE TRAINING NEEDS
- B. DETERMINE APPROPRIATE TRAINING APPROACH
- C. DESIGN AND DEVELOP A TRAINING PROGRAM
- D. PREPARE INSTRUCTIONAL MATERIALS
- E. TRAIN AND EVALUATE TRAINERS
- F. MANAGE EXTERNAL TRAINING PEOPLE AND MATERIALS
- G. ADVISE AND COUNSEL EMPLOYEES ON TRAINING AND DEVELOPMENT
- H. ASSIST MANAGERS AND OTHERS WITH PERFORMANCE PROBLEMS AND ON-THE-JOB TRAINING

II. IMPLEMENTATION - INDIVIDUAL TRAINING AND DEVELOPMENT PROGRAM

- I. CONDUCT CLASSROOM TRAINING
- J. USE VARIED TECHNIQUES FOR INFLUENCING BEHAVIOUR IN GROUPSAND THE ORGANISATION

III. RESEARCH - ALL TRAINING AND DEVELOPMENT PROGRAMS

- K. CONDUCT RESEARCH ON TRAINING AND DEVELOPMENT

IV. MANAGING - ALL TRAINING AND DEVELOPMENT PROGRAMS

- L. ESTABLISH AND MAINTAIN WORKING RELATIONSHIPS WITH MANAGERS
- M. MANAGE THE TRAINING AND DEVELOPMENT PROCESS

V. PROFESSIONAL SELF-DEVELOPMENT

- N. KEEP WELL INFORMED ON CHANGES IN TRAINING AND DEVELOPMENT

The respondents were also asked to use a rating scale to estimate which proportion of their work time they spent on each task in relation to all the other tasks which they had performed. An extract from the task list, contains Duty A. - ANALYSE TRAINING NEEDS, some of the task statements for that duty, and the rating scale these are shown in Figure 2.

An extract from the Task Analysis of Student Teaching Practice is shown in Figure 3.

FIGURE 2 - ANALYSE TRAINING NEEDS

A. ANALYSE TRAINING NEEDS

In this role training and development professionals

- construct questionnaires for needs analysis
- conduct interviews for needs analysis
- evaluate training programs

Card No. 2

Task No.	TASK TITLE	P	Time Spent 1 = a very little amount of time 9 = a very large amount of time	Office Use Only
A-1	Construct questionnaires for analysis of training and development needs A-1		1 2 3 4 5 6 7 8 9	11
A-2	Construct questionnaires for evaluating training and development programs and materials A-2		1 2 3 4 5 6 7 8 9	12
A-3	Use surveys or questionnaires to identify training and development needs A-3		1 2 3 4 5 6 7 8 9	13
A-4	Conduct interviews or informal discussions to identify training needs A-4		1 2 3 4 5 6 7 8 9	14
A-5	Make inspections to identify on-the-job training needs A-5		1 2 3 4 5 6 7 8 9	15
A-6	Identify the causes of high failure or excessive on-the-job training time A-6		1 2 3 4 5 6 7 8 9	16
A-7	Evaluate supervisors of on-the-job training programs A-7		1 2 3 4 5 6 7 8 9	17
A-8	Evaluate on-the-job training programs A-8		1 2 3 4 5 6 7 8 9	18
A-9	Evaluate reports on on-the-job training programs A-9		1 2 3 4 5 6 7 8 9	19
A-10	Evaluate requests for training services A-10		1 2 3 4 5 6 7 8 9	20
Please write in any tasks which you perform but are not listed in this role.				

INVENTORY CONTINUED ON NEXT PAGE

SUMMARY OF TEACHING RESPONSIBILITIES AND TASKS
IN STUDENT TEACHING PRACTICE

I. PREPARATION AND PLANNING

- A - Aims and Objectives
- B - Factors Influencing Learning - People
- C - Factors Influencing Learning - Resources
- D - Lesson Content
- E - Learning Activities
- F - Teaching Procedures
- G - Evaluation Procedures
- H - Writing the Lesson Plan

II. TEACHING PROCESS SKILLS

- I - Beginning the Lesson
- J - Explanations and Demonstration Skills
- K - Effective Use of Media and Materials
- L - Discussion Skills
- M - Questioning Skills
- N - Written and Verbal Skills
- O - Variety of Presentation
- P - Class Management Skills
- Q - Evaluation
- R - Ending the Lesson

III. TEACHER/PUPIL RELATIONSHIPS

- S - Encourages Pupil Participation
- T - Caters for Individual Differences
- U - Uses Positive Reinforcement
- V - Rapport

IV. PROFESSIONAL DEVELOPMENT

- W - Adopts Professional Role
- X - Classroom Manner
- Y - Flexibility
- Z - Responsive and Self Critical

V. SUBJECT COMPETENCE

- Aa - Knowledge of Subject Matter

TEACHING RESPONSIBILITY A - AIMS AND OBJECTIVES

Card No. 1

Task No.	Task Title		P	Time Spent	Office Use
A-1	Select objectives for the students' learning	A-1		1 2 3 4 5 6 7 8 9	11
A-2	Write measurable and observable objectives	A-2		1 2 3 4 5 6 7 8 9	12
A-3	Identify learning objectives about knowing, being and doing	A-3		1 2 3 4 5 6 7 8 9	13
A-4	State longterm program with degree of emphasis on different goods and subjects	A-4		1 2 3 4 5 6 7 8 9	14
A-5	Read and examine lists of behavioural objectives	A-5		1 2 3 4 5 6 7 8 9	15
A-6	Compare good example of behavioural objectives with objectives from your own lesson plan	A-6		1 2 3 4 5 6 7 8 9	16
	Please write in any tasks which you perform but are not listed in this teaching responsibility.				

INVENTORY CONTINUED ON NEXT PAGE

FIGURE 3 - SUMMARY OF TEACHING DUTIES AND TASKS

Some of the very considerable advantages of the Task Inventory approach to the collection and analysis of occupational data are :

that the information requires recognition rather than recall. Several of the respondents wrote in the special comments section at the end of the inventory expressing their appreciation of this feature.

"A well-thought out and easy to answer questionnaire. for once I could concentrate on my answers and not on how to fill out the form."

"I found the questionnaire interesting and educational".

"Comprehensive, well laid out and easy to complete. took me 30 minutes to complete".

that the person actually doing the job gives the information.

that very large groups can be surveyed.

that responses can be stored, manipulated and analysed by computer.

that the COMPREHENSIVE OCCUPATIONAL DATA ANALYSIS PROGRAMS (CODAP) have been specially designed to manipulate and analyse occupational data.

EMPIRICAL BASIS FOR THE 'TIME SPENT' SCALE

The task inventory data can be analysed with correlation, cluster analysis and cross-tabulational techniques owing to the use of the twin concepts of TASKS PERFORMED and RELATIVE TIME SPENT ON EACH TASK.

Some commentators have asked why 'relative time spent' was used as the fundamental measure, rather than the more common 'absolute time values' or 'frequency'.

The difficulty with absolute time values is that respondents are asked to estimate in minutes and hours, or percentage, the amount of time they spend on each task. This system breaks down as analysts find that the sum of the estimates often far exceeds the number of hours in the working week.

'Frequency' counts are advocated and used by many researchers for the analysis of jobs. This technique may involve the respondent in estimating or counting the frequency of performance of each task. The information derived from this approach provides information which is hard to handle or interpret.

The 'relative time spent' rating scale is used because it provides reliable information. Test-retest studies show reliability coefficients in the high .70s. Interviews with people doing the job and supervisors have been used to confirm the reliability of the 'relative time spent' rating. (Moore, 1974)

USE OF 'TIME SPENT' AND 'TASKS PERFORMED' PROGRAMS

CODAP contains several 'time spent' and 'tasks performed' programs. These are designed to record, compute and manipulate the information provided in the task inventories which shows which tasks are performed and the relative time spent on them. Five of the most commonly used programs are:

OVERLAP

GROUP

DIAGRAM

JOB DESCRIPTIONS

GROUP DIFFERENCES

OVERLAP was used to convert each task rating into a per cent time spent rating for the respondent. The sum of the percentage taks ratings for each respondent was 100%.

GROUP was used to cluster respondents according to the similarity of their per cent time spent ratings of the tasks performed. The clustering was done in stages. At each stage the groups became larger, while the similarity ratings became lower.

DIAGRAM provided a pictorial representation of the results of the clustering process.

The other two programs provided job descriptions and detailed descriptions of the differences between the job descriptions of selected groups of trainers.

TWO TYPES OF GROUP DESCRIPTIONS

Two types of group descriptions were created to describe duties and tasks.

Duty Job Description provided more detailed job profiles by listing all the tasks in the inventory. Both descriptions were accompanied by the following information :

the percentage of the members of the group who performed the task;

the average percentage of time spent by the members of the group who performed the task;

the average percentage of time spent on each tas for all members of the group;

the cumulative sum of the average percentage of time spent by all members of the group.

GROUP DIFFERENCES provided very precise quantitive information on the differences in tasks performed and the average percentage of time spent on these tasks for selected pairs of groups in the survey.

DUTY JOB DESCRIPTION OF ALL TRAINERS IN THE SAMPLE

The CODAP computer programs were used to compile composite job descriptions of the whole sample of trainers and selected sub-groups. These job descriptions are prepared in two forms, the Duty Job Description and the Task Job Description.

The Duty Job Description of all the trainers in the sample, which will be discussed first, is displayed in Figure 4.

Summary of vectors: Extracted at 4.34 pm on 20 Dec 81 Page 2

JOB DESCRIPTION — ALL MEMBERS SURVEYED IN WORK OF TRAINERS IN INDUSTRY, STUDY

Sorting: Output is sorted on column 3 Sort is descending

Suppression: Print suppression on column 3 Not printed if value LT .0010

	Duties	ALL-RESP Prct Perf	ALL-RESP %Tme Perf	ALL-RESP %Tme All ****	Cum <---	Sec
I	CONDUCT CLASSROOM TRAINING	95.64	23.80	22.76	22.8	1
C	DESIGN AND DEVELOP TRAINING PROGRAMS	98.55	17.19	16.94	39.7	2
M	MANAGE THE TRAINING AND DEVELOPMENT PROCESS	93.90	7.74	7.27	47.0	3
J	USE VARIED TECHNIQUES FOR INFLUENCING BEHAVIOUR IN GROUPS AND THE ORGANIZATION	92.44	6.74	6.23	53.2	4
K	CONDUCT AND REPORT RESEARCH ON TRAINING AND DEVELOPMENT	93.90	6.57	6.17	59.4	5
D	PREPARE INSTRUCTIONAL MATERIALS	95.35	6.16	5.88	65.2	6
A	ANALYSE TRAINING NEEDS	97.67	5.80	5.66	70.9	7
N	KEEP WELL INFORMED ON CHANGES IN TRAINING AND DEVELOPMENT	96.84	4.84	4.78	75.7	8
C	COUNSEL AND ADVISE EMPLOYEES ON TRAINING AND DEVELOPMENT	93.60	5.05	4.73	80.4	9
H	ASSIST MANAGERS AND OTHERS WITH JOB PERFORMANCE PROBLEMS AND ON-THE-JOB TRAINING	91.86	5.14	4.72	85.1	10
L	ESTABLISH AND MAINTAIN WORKING RELATIONSHIPS WITH MANAGERS	94.19	4.73	4.46	89.6	11
F	MANAGE EXTERNAL TRAINING PEOPLE AND MATERIALS	92.15	4.62	4.26	93.9	12
E	TRAIN AND EVALUATE TRAINERS	92.15	3.46	3.18	97.0	13
B	DETERMINE APPROPRIATE TRAINING APPROACH	97.09	3.05	2.96	100.0	14

Figure 4-DUTY JOB DESCRIPTION OF TRAINERS

The first column of figures is headed, ALL - RESP Prct Perf. This means that the numbers below represent the percentage of the entire group of respondents who performed the duty. For example, Duty I - CONDUCT CLASSROOM TRAINING, was performed by 95.64% of the total sample of trainers in the survey. It can be seen that all of the duties are performed by more than 90% of the group.

Column 2 indicates the percentage of time spent on this duty by the members of the group performing the task. For example, 23.8% of the work time of those members performing the duty, is spent on Duty I. The next most time-consuming is Duty C - DESIGN AND DEVELOP TRAINING PROGRAMS, which takes up 17.19% of the time.

Column 3 is headed AL -RESP % Tme ALL. This means that the figures below are for all members of the survey group, and that they indicate the per cent time spent by all members of the group. In this column the time spent rating is averaged over the whole group including those who did not perform the duty. Therefore the time spent rating for Duty I is slightly lower at 22.76%.

Column 4 provides a cumulative total of the per cent time spent ratings from column 3. Note that the ratings in Column 4 are rounded off to one decimal place. i.e. 22.76 is rounded off to 22.8 and 16.94 is rounded off to 16.9, to give 39.7% as the cumulative total for the time spent on these two duties.

Column 5, headed Seq, is useful for reading the number of duties taking up a selected percentage of the time spent. For exampe, it is common practice to identify those duties which take up approximately 25%, 50% and 75% of the group's work time. Duty I - CONDUCT CLASSROOM TRAINING, fits within the 25% category with 22.76% of time spent, while DUTIES C and M bring the time spent up to 47% of the work time of the training personnel surveyed. The top three duties are listed in Figure 5.

Figure 5. TOP THREE DUTIES OF TRAINERS

DUTY TITLES	% Time Spent	Cum	Seq
I CONDUCT CLASSROOM TRAINING	22.76	22.76	1
C DESIGN AND DEVELOP TRAINING	16.94	39.70	2
M MANAGE THE TRAINING AND DEVELOPMENT PROCESS	7.27	46.97	3

TASK JOB DESCRIPTION OF ALL TRAINERS IN THE SURVEY

Task job descriptions are designed to provide a more detailed job profile. Instead of being limited to the 14 duties, the task job description provides a job profile consisting of all 131 of the tasks from the printout shown in Figure 6.

Summary of vectors Extracted at 8.31 pm on 17 Dec 81 Page 2

JOB DESCRIPTION - ALL MEMBERS SURVEYED IN WORK OF TRAINERS IN INDUSTRY STUDY

Sorting: Output is sorted on column 3 Sort is descending

Suppression: Print suppression on column 3 Not printed if value LT .0010

	Tasks	ALL-RESP Prct Perf	ALL-RESP %Tme Perf	ALL-RESP %Tme All ****	Cum <---	Seq
C-15	Design specific programs to satisfy training needs	94.19	1.427	1.344	1.34	1
L-114	Establish and maintain good working relationships with managers as clients	88.08	1.491	1.313	2.66	2
C-19	Establish precise objectives for training programs	92.15	1.413	1.302	3.96	3
I-92	Speak to the group clearly and effectively	89.24	1.415	1.263	5.22	4
C-23	Select appropriate resources and materials for training programs	94.19	1.339	1.261	6.48	5
I-70	Conduct training programs	92.73	1.356	1.257	7.74	6
N-128	Read the literature on training and development	98.26	1.259	1.237	8.98	7
I-87	Foster a group climate which encourages participation in the learning process	88.95	1.379	1.227	10.20	8
L-116	Advise managers and supervisors on training and development	90.12	1.317	1.187	11.39	9
C-25	Design or select activities so that participants will learn effectively	91.28	1.292	1.179	12.57	10
C-21	Determine structure of training program, e.g. length, number of participants, choice of techniques, organisation of seating	92.15	1.271	1.172	13.74	11
I-82	Present instructional materials in an appropriate manner	87.79	1.329	1.167	14.91	12
I-81	Give clear explanations	86.92	1.338	1.163	16.07	13
I-84	Initiate and sustain discussions	88.09	1.316	1.159	17.23	14
I-74	Conduct discussions	90.70	1.221	1.107	18.34	15
I-83	Formulate key questions to promote discussions	87.21	1.267	1.105	19.44	16
I-91	Present clearly written instructional materials	86.63	1.271	1.101	20.54	17
C-26	Select appropriate instructional materials	90.41	1.212	1.096	21.64	18
I-90	Use a variety of class management skills	86.05	1.266	1.090	22.73	19
I-85	Ask clear and precise questions	86.34	1.260	1.088	23.82	20
C-22	Select and sequence topics in training programs	88.08	1.229	1.082	24.90	21
C-17	Apply adult learning theory and instructional techniques when designing training and development programs	95.47	1.266	1.083	25.98	22
I-80	Demonstrate clearly to enable participants to be actively involved in learning	84.59	1.268	1.073	27.05	23
J-97	Use discussion techniques	84.59	1.263	1.068	28.12	24
L-117	Explain training recommendations to managers to gain their acceptance	83.72	1.245	1.043	29.16	25
I-89	Change instructional procedures when participants do not understand	86.05	1.199	1.032	30.20	26
I-79	Present activities which suit the participants' needs and interests	84.59	1.218	1.031	31.23	27
M-118	Prepare and present plans for training and development programs	85.47	1.204	1.029	32.25	28
C-15	Decide whether existing programs, course outlines, lesson plans will satisfy the training needs	91.28	1.115	1.018	33.27	29

FIGURE 6 - TASK JOB DESCRIPTION OF TRAINERS

The tasks are arranged in descending order from the most time-consuming to the least. At the top of the list with 1.34% of time spent is Task C-16 Design specific programs to satisfy training needs. While at the end of the list is Task D - 37 Prepare computer-assisted instruction materials.

By reading Columns 4 (Cum) and 5 (Seq) the number of tasks taking up 25%, 50% and 75% can be read as 21, 47 and 81 respectively.

The value of the more precise job profile can be seen when reading the task identification numbers which precede the task titles. In the Duty Job Description we saw that Duty I took up 22.76% of the time of the group, and was the most time-consuming duty. However if we look at the 21 tasks which take up the top 25% of time spent by the group, we find that the tasks are distributed as follows :

Figure 7 - Number of Tasks in Top 25% of Time Spent

Identification Word for Duty		Number of tasks from Duty
I	INSTRUCT	11
C	DESIGN	7
M	MANAGE	2
J	INFLUENCE	1

Duty I - INSTRUCT is represented by 11 out of the 21 tasks, while Duty C - DESIGN, which was the second most time-consuming with 16.94%, is represented by 7 tasks. Duty L - MANAGE EXTERNAL TRAINING PEOPLE, which was number 11 in the sequence of duties with 4.46% of the time spent, was represented by tasks I-114 and I-116 which are second and ninth respectively in the 131 task sequence.

CLUSTERIN PROCESS AND DIAGRAM

Identifying Job Types Within the Training and Development Occupation.

The precise and detailed identification and description of significant types of jobs within the occupation is an important function of job analysis. A CODAP clustering program is used to compare the detailed task-level job descriptions of each person who responded to the survey.

The clustering program locates the two respondents with the most similar task job descriptions. These two cases are formed into a single group with a consolidated job description. The result of the merging process is expressed as the percentage overlap in the job descriptions. The results of the clustering process are shown in pictorial form with a program called DIAGRAM. An extract from the DIAGRAM printout is shown in Figure 8.

COLUMN 1

WORK OF TRAINERS IN INDUSTRY
X = 71.66 Y = 20.00 W = 5 N/V = 171 NSTAGE = 343

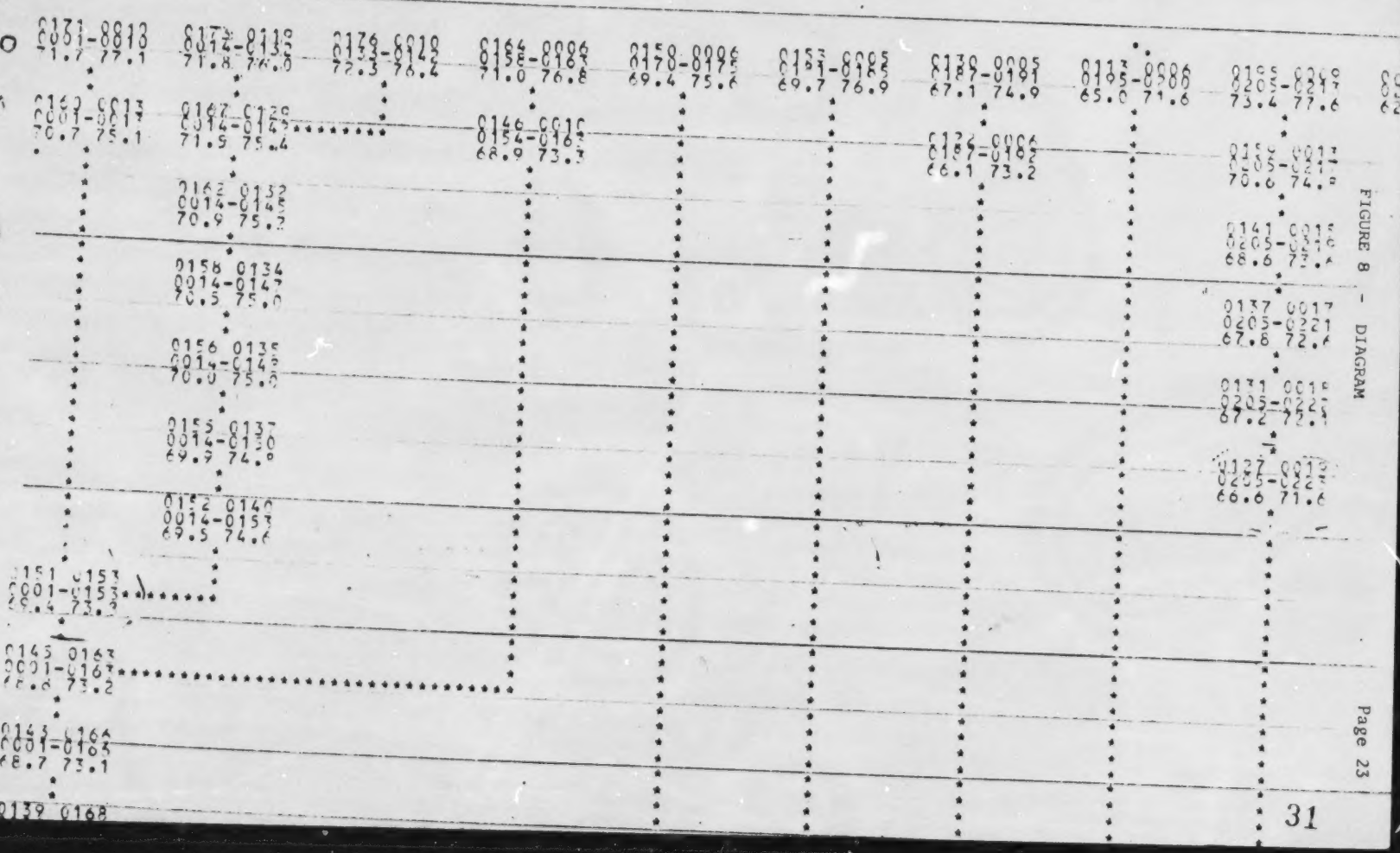

FIGURE 8 - DIAGRAM

ANALYSIS OF DIAGRAM PRINTOUT

The information from the clustering programs is used by the DIAGRAM program to produce the tree-like diagram which graphically displays the results of the grouping process. Each rectangular block of data in the diagram represents a group formed by the clustering process and key information about that group. An extract from the DIAGRAM printout is shown in Figure 9.

Figure 9 EXTRACT FROM DIAGRAM PRINTOUT

```
----
          0082 0007
          0243-0249
          60.4 67.2
              .
              .
              .
              .
                                                    0
085 0010
                                                    0
250-0289
                                                    6
2.9 66.7
.
.
.
.
          0080 0017
.
          0243-0259
          59.8
63.5.....................................
              .
              .
              .
              .
          0068 0019
          0243-0261
          57.7 62.6
-------------------------------------------------
-
```

Each block of data has five pieces of numerical information. One example from the above extract is interpreted as follows :
0080 is the GROUP NUMBER and the STAGE at which the group was formed by merging the two smaller groups 0082 and 0085.

0017 is the number of trainers in this group. This number was made by clustering the two groups of 7 and 10 members from Groups 80 and 85 respectively.

0243-0259 is the range of KPATH NUMBERS which were allotted to each respondent, according to their similarity, by the clustering process. KPATH numbers 0243-0244 in this group indicate that these two trainers have very similar job descriptions.

59.8 is the BETWEEN OVERLAP INDEX. This is the average percentage of overlap 'between' all possible pairings of the members of group 0082 with group 0085.

63.5 is the WITHIN OVERLAP INDEX. This index is the average percentage of overlap 'within' all possible pairs of individuals within the combined group.(Group 0080). THerefore the within overlap is the average of the of the the 17 pairs of overlap as computed by the OVERLAP PROGRAM.

JOB TYPES IN TRAINING

A simplified JOB-TYPES DIAGRAM is shown in Figure 10.

Eight groups or job-types are shown at the botton of the diagram. Six groups are shown in the main stem of the diagram. Ther line indicate where each job-type merges back to the main group. All of the groups are sub-sets of Group 1 with 344 members.

Group 5 is the most deviant group, being the last to rejoin the main group. Group 127 while having a main set of duties which distinguishes it from the others, merges with the main stream before all the other small groups.

The descriptive words beside each group refer to the duties which take up 50% of the work time of the group.

The eight groups have been regrouped into five according to the similarity of their duty description. The groups and the names of the duties on which they spend 25% and 50% of their time are shown in Figure 11.

FIGURE 10

JOB-TYPES DIAGRAM

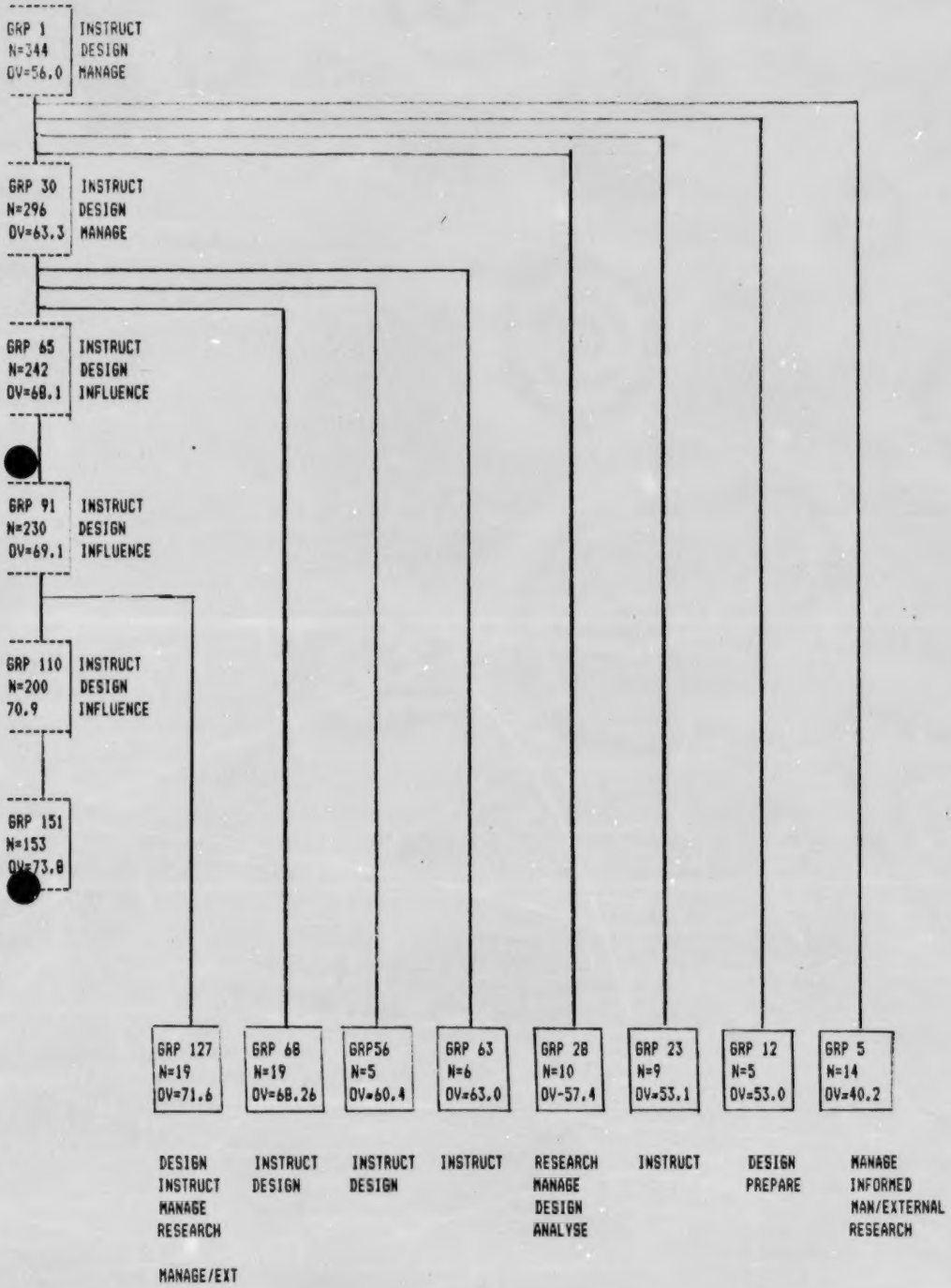

Figure 11.

FIVE JOB TYPES

DUTIES ON WHICH 25% AND 50% OF TIME SPENT

	FIRST 25% OF TIME		SECOND 25% OF TIME	
GROUP	TITLE	%	TITLE	%
23	INSTRUCT	45.46	(SAME)	
63	INSTRUCT	47.82	(SAME)	
68	INSTRUCT	32.90	DESIGN	23.74
56	INSTRUCT	24.99	DESIGN	22.78
127	DESIGN	14.42	MANAGE	9.48
	INSTRUCT	9.57	RESEARCH	9.11
			MANAGE/EXTERNAL	8.47
28	RESEARCH	15.63	DESIGN	10.55
	MANAGE	11.44	ANALYSE	10.05
12	DESIGN	32.39	PREPARE	21.73
5	MANAGE	13.51	MANAGE/EXTERNAL	10.00
	INFORMED	11.91	RESEARCH	9.90

BACKGROUND INFORMATION

CODAP is used to codify and cross tabulate all the background variables for each of these groups. A selection of some of the features which distinguished each group from the others is shown in Figure 12.

Figure 12.

OUTSTANDING FEATURES OF EACH JOB TYPE

GROUP	FEATURES
23	Most years in training and development. Least number of training and development personnel supervised. Highest proportion in the government and semi-government sectors. Second lowest salaries.
63	Lowest salaries
68	Greatest number of years in present position. Oldest age group. Smallest organisation by budget or sales.
56	Highest proportion in private industry. Smallest organisations by number of employees.
127	Youngest age group. Largest number of tasks performed. Greatest percentage overlap (71.6%) i.e. the most homogeneous group.
28	Higher salaries. Greatest number of training and development personnel supervised.
12	Highest proportion of females. Fewest year in present position. Largest organisation, by number of employees. Largest organisation by budget or sales. Highest proportion in private industry.
5	Smallest number of tasks performed. Fewest years in training and development. Lowest overlap. (40.2%) All male.

GROUP PROFILES OF JOB TYPES

The Group Profiles Diagram in Figure 13 provides a systematic comparison of each of the fourteen groups on sixteen variables.

GROUP PROFILES

FIGURE 13

GROUP NO	001	151	110	91	65	30	127	68	56	63	28	23	12	5
SEQUENCE WITHIN CLUSTER	1-344	1-153	1-200	1-230	1-242	1-296	205-223	243-261	267-271	275-285	297-306	309-317	324-328	329-342
PERCENTAGE OF SAMPLE	100	45	58	67	70	86	5	5	1	2	3	3	1	1
NO. IN GROUP	344	153	200	230	242	296	19	19	5	6	10	9	5	14
OVERLAP WITHIN GROUP %	56.0	73.8	70.9	69.1	68.1	63.3	71.6	62.6	66.4	65.9	57.4	53.1	53.0	40.2
MEAN LEVEL OF NOS. OF GROUPS TRAINED	5.16	5.78	5.64	5.54	5.56	5.38	4.58	3.84	2.80	5.67	5.10	3.33	2.00	4.62
MEAN SALARY LEVEL	3.18	3.16	3.16	3.17	3.16	3.13	3.63	3.00	3.00	1.83	4.00	2.22	2.60	3.93
MEAN LEVEL OF NO. OF TRNG. PERSONNEL SUPERVISED	1.71	1.69	1.70	1.73	1.71	1.72	2.11	1.37	2.20	1.33	2.50	1.00	1.40	1.71

ORGANISATION

SECTOR														
- GOVERNMENT -%	28	31	28	29	29	28	32	32	20	33	20	33	20	29
- SEMI-GOV'T -%	11	10	10	9	9	9	10	5	0	0	20	22	0	21
- PRIVATE -%	61	59	62	62	62	63	58	63	80	67	60	45	80	50
MEAN SIZE OF ORGANISATION -NO. EMPLOYEES (1-5)	3.24	3.13	3.12	3.17	3.20	3.19	3.61	3.00	2.20	2.67	4.00	3.75	4.80	3.38
MEAN SIZE OF ORGANISATION -SALES/BUDGET (1-5)	5.12	5.28	5.21	5.19	5.22	5.19	5.81	4.33	5.25	5.50	4.71	5.33	7.00	4.69

GENERAL INFORMATION

MEAN AGE	37.8	38.1	37.8	37.6	37.8	37.8	36.0	36.7	41.4	38.3	39.1	32.9	38.2	40.3
SEX - MALE %	83	83	81	83	83	83	84	74	80	67	90	67	60	100
- FEMALE %	17	17	19	17	17	17	16	26	20	33	10	33	40	0
YEARS IN TRNG. & DEVEL (MEAN)	8.1	8.2	8.3	7.9	8.2	8.1	5.1	6.9	7.8	7.2	8.1	12.8	6.4	5.8
YEARS IN PRESENT POS'N (MEAN)	3.2	3.2	3.2	3.1	3.1	3.3	1.7	4.4	3.0	2.2	2.9	3.7	1.0	3.3

TASK INFORMATION

NO. OF DUTIES -25% T.Spent	1	1	1	1	1	1	2	1	1	0	2	0	0	2
-50%	3	3	3	3	3	3	5	2	2	1	4	1	1	4
-75%	8	7	7	8	7	7	8	5	6	5	7	3	3	7
NO. OF TASKS -25% T.Spent	21	22	21	22	22	21	21	14	14	9	14	10	6	10
-50%	47	49	48	49	49	47	47	31	32	24	33	23	17	25
-75%	80	84	82	84	83	81	79	58	55	53	61	44	35	46
MEAN NO. OF TASKS PERFORMED	103	127	122	121	120	112	127	75	66	83	83	49	42	41

Summary of vectors Extracted at 8.34 pm on 18 Feb 82 Page 2

JOB DESCRIPTION - ALL MEMBERS BELONGING TO GROUP 5 (KPATH 329-342)

Sorting: Output is sorted on column 3 Sort is descending

Suppression: Print suppression on column 3 Not printed if value LT .0010

	Tasks	Memb G005 Prct Perf	Memb G005 %Tme Perf	Memb G005 %Tme All ****	Cum <---	Seq
N-130	Acquire information about training and development activities in other organizations, e.g. competitors, Industry Training Committees	100.00	2.824	2.824	2.82	1
K-113	Communicate with government personnel on training and development matters	50.00	5.573	2.787	5.61	2
N-128	Read the literature on training and development	100.00	2.766	2.766	8.38	3
M-118	Prepare and present plans for training and development programs	78.57	3.353	2.635	11.01	4
A-10	Evaluate requests for training services	92.86	2.743	2.547	13.56	5
L-116	Advise managers and supervisors on training and development	71.43	3.492	2.495	16.05	6
N-131	Acquire information about government activities related to training and development practices	78.57	3.010	2.365	18.42	7
L-114	Establish and maintain good working relationships with managers as clients	57.14	3.981	2.275	20.69	8
A-4	Conduct interviews or informal discussions to identify training needs	85.71	2.572	2.204	22.90	9
F-50	Identify and avaluate outside programs or materials for thier applicability	78.57	2.644	2.077	24.98	10
M-119	Prepare and present budgets for training and development programs	71.43	2.828	2.020	27.00	11
N-129	Review new programs and materials on training and development	85.71	2.339	2.005	29.00	12
B-11	Determine suitability of 'ready-made' courses and materials	85.71	2.293	1.966	30.97	13
N-127	Attend seminars and conferences to increase knowledge and skills in training and development	100.00	1.952	1.952	32.92	14
G-60	Prepare and disseminate announcements about internal and external training and development programs	71.43	2.537	1.812	34.73	15
M-126	Evaluate training programs	57.14	3.141	1.795	36.53	16
G-56	Arrange for participation in external training and development programs	64.29	2.731	1.755	38.26	17
F-52	Arrange for participation in external training and development programs	57.14	3.040	1.737	40.02	18
L-117	Explain training recommendations to managers to gain their acceptance	57.14	2.948	1.684	41.70	19
G-57	Establish and maintain a library, e.g. of training resources, career development information	57.14	2.905	1.660	43.36	20
F-49	Evaluate proposals from outside consultants	78.57	2.088	1.641	45.00	21
F-53	Develop programs or courses in collaboration with colleges, universities or other institutions	50.00	3.204	1.602	46.61	22
M-120	Organise and staff the training and development	35.71	4.405	1.573	48.18	23

FIGURE 14

Page 33

Summary of vectors Extracted at 8.34 pm on 18 Feb 82 Page 2

JOB DESCRIPTION - ALL MEMBERS BELONGING TO GROUP 63 (KPATH 275-280)

Sorting: Output is sorted on column 3 Sort is descending

Suppression: Print suppression on column 3 Not printed if value LT .0010

	Tasks	Memb G063 Prct Perf	Memb G063 %Tme Perf	Memb G063 %Tme All ****	Cum <---	Seq
I-81	Give clear explanations	100.00	2.873	2.873	2.87	1
I-92	Speak to the group clearly and effectively	100.00	2.825	2.825	5.70	2
I-78	Conduct training programs	100.00	2.789	2.789	8.49	3
I-78	Arouse the participants' interest in the program	100.00	2.722	2.722	11.21	4
I-80	Demonstrate clearly to enable participants to be actively involved in learning	100.00	2.638	2.638	13.85	5
I-85	Ask clear and precise questions	100.00	2.600	2.600	16.45	6
I-87	Foster a group climate which encourages participation in the learning process	100.00	2.590	2.590	19.04	7
I-79	Present activities which suit the participants' needs and interests	100.00	2.550	2.550	21.59	8
I-83	Formulate key questions to promote discussions	100.00	2.528	2.528	24.11	9
I-82	Present instructional materials in an appropriate manner	100.00	2.517	2.517	26.63	10
I-84	Initiate and sustain discussions	100.00	2.267	2.267	28.90	11
I-86	Analyse and alter patterns of classroom behaviour where appropriate	100.00	2.253	2.253	31.15	12
J-97	Use discussion techniques	100.00	2.143	2.143	33.29	13
I-71	Present a lecture, with or without media	83.33	2.294	1.912	35.21	14
I-90	Use a variety of class management skills	100.00	1.870	1.870	37.08	15
I-91	Present clearly written instructional materials	100.00	1.729	1.729	38.81	16
I-74	Conduct discussions	83.33	2.012	1.677	40.48	17
L-114	Establish and maintain good working relationships with managers as clients	83.33	1.933	1.611	42.09	18
I-76	Present training film on videotape	100.00	1.563	1.563	43.66	19
I-72	Present programmed instruction materials	66.67	2.207	1.471	45.13	20
I-89	Change instructional procedures when participants do not understand	100.00	1.428	1.428	46.56	21
I-88	Identify the causes of inadequate learning	83.33	1.667	1.389	47.94	22
I-77	Conduct employee induction programs	83.33	1.667	1.389	49.33	23
I-75	Operate audio-visual equipment	83.33	1.552	1.293	50.63	24
M-124	Maintain records of participation in training and development programs	83.33	1.494	1.245	51.87	25
C-16	Design specific programs to satisfy training needs	100.00	1.188	1.188	53.06	26
J-100	Use role playing techniques	83.33	1.292	1.077	54.14	27
M-123	Maintain and control training materials and equipment	83.33	1.229	1.024	55.16	28
L-116	Advise managers and supervisors on training and development	100.00	1.007	1.007	56.17	29
C-19	Establish precise objectives for training programs	100.00	.956	.956	57.12	30
G-59	Administer program for the reimbursement of training costs	66.67	1.419	.946	58.07	31
I-73	Organise role-playing activities	33.33	2.834	.945	59.01	32

FIGURE 15 - GROUP 63 TASK JOB DESCRIPTION

Page 34

13

14

Summary of vectors Extracted at 8.36 pm on 20 Feb 82 Page 3

JOB DIFFERENCE DESCRIPTION: GROUP 5 - GROUP 110

Sorting: Output is sorted on column 7 Sort is descending

Suppression: Print suppression on column 7 Not printed if value LT .2500

	Duties	Memb G005 Prct Perf	Memb G110 Prct Perf	Diff <---	Seq	Memb G005 %Tme All	Memb G110 %Tme All
N	KEEP WELL INFORMED ON CHANGES IN TRAINING AND DEVELOPMENT	100.00	100.00	.00	1	11.91	4.07
M	MANAGE THE TRAINING AND DEVELOPMENT PROCESS	100.00	100.00	.00	2	13.51	9.13
F	MANAGE EXTERNAL TRAINING PEOPLE AND MATERIALS	100.00	97.00	3.00	3	10.00	3.83
G	COUNSEL AND ADVISE EMPLOYEES ON TRAINING AND DEVELOPMENT	78.57	98.00	-19.43	4	9.49	4.59
L	ESTABLISH AND MAINTAIN WORKING RELATIONSHIPS WITH MANAGERS	78.57	98.50	-19.93	5	7.74	3.94
K	CONDUCT AND REPORT RESEARCH ON TRAINING AND DEVELOPMENT	85.71	100.00	-14.29	6	9.90	6.20
A	ANALYSE TRAINING NEEDS	100.00	100.00	.00	7	8.86	6.47
E	TRAIN AND EVALUATE TRAINERS	71.43	97.50	-26.07	8	5.76	3.83
B	DETERMINE APPROPRIATE TRAINING APPROACH	92.86	100.00	-7.14	9	3.21	2.87
H	ASSIST MANAGERS AND OTHERS WITH JOB PERFORMANCE PROBLEMS AND ON-THE-JOB TRAINING	64.29	98.50	-34.21	10	4.53	4.87
D	PREPARE INSTRUCTIONAL MATERIALS	57.14	99.00	-41.86	11	2.80	5.80
J	USE VARIED TECHNIQUES FOR INFLUENCING BEHAVIOUR IN GROUPS AND THE ORGANIZATION	42.86	99.50	-56.64	12	1.59	7.26
C	DESIGN AND DEVELOP TRAINING PROGRAMS	78.57	100.00	-21.43	13	6.95	10.96
I	CONDUCT CLASSROOM TRAINING	64.29	100.00	-35.71	14	4.19	24.10

15

16

FIGURE 16

SIMILARITIES AND DIFFERENCES
BETWEEN THE MAJOR ROLES
OF TRAINERS AND TEACHERS.

The similarities and differences between the work of trainers and teachers are listed briefly under these headings:

Types of Roles

Definition of Roles

Job-Types within the Occupation Range of Qualification

Hierarchical Differences within each Occupation

Differences in Clients

TYPES OF ROLES

TRAINERS	TEACHERS
I PLANNING & PREPARATION OF PROGRAMS	I PLANNING & PREPARATION OF TEACHING PROGRAMS
II IMPLEMENTATION OF TRAINING & DEVELOPMENT PROGRAMS	11 USING TEACHING PROCESS SKILLS
III CONDUCTING RESEARCH ON TRAINING & DEVELOPMENT	111 DEVELOPING TEACHER PUPIL RELATIONSHIPS
IV MANAGING TRAINING & DEVELOPMENT PROGRAMS	IV PROFESSIONAL SELF-DEVELOPMENT
V PROFESSIONAL SELF DEVELOPMENT	V ACQUIRING & USING SUBJECT KNOWLEDGE AND SKILLS

DEFINITION OF ROLES

TRAINERS	TEACHERS
GREAT UNCERTAINTY ABOUT ROLES IN TRAINING AND DEVELOPMENT	ROLES OF TEACHERS RELATIVELY CLEARLY DEFINED

JOB TYPES WITHIN THE OCCUPATION

RANGE OF JOB TYPES AMONG TRAINERS

A wide variety of job titles is used in job descriptions for trainers :
Training Manager
Training Officer
Instructor
Industrial Training Officer
Staff Development Officer
Personnel Manager
Consultant
Manpower Development Officer

The main job-types in this study were :

Instructor
Instructor-Designer
Designer-Preparer
Designer -Instructor-Manager-Researcher
Manager-Researcher

JOB TYPES AMONG TEACHERS

The one term 'teacher' is applied to all in the school regardless of specialty (languages, maths etc.) or responsibility (class teacher, co-ordinator, principal, consultant.) or level (primary or secondary)

RANGE OF QUALIFICATIONS

At present

At present the training of trainers can vary widely
1 week course
18 week course
Associate Diploma.

Training personnel may also have undergraduate or postgraduate qualifications in a variety of other fields, such as engineering, accountancy, personnel and so on.

Over a 30 year period teachers qualifications have run the gamut from :

No training
Pupil Teacher system
1 year training
2 year training
3 year training
4 year training

HIERARCHICAL DIFFERENCES WITHIN EACH PROFESSION

One valuable test of the strength of a hierarchy is the range of salaries offered and the other is the nature of the work performed.

TRAINERS	TEACHERS
Salary differences, including special remuneration packages, are quite substantial.	Salary differences between teachers are based largely on years of teaching and position as class teacher or adminstrator. Young and old class teachers work side by side performing essentially the same range of tasks.
These differences are related to the types of people trained (apprentices or manager) and the extent to which one is involved in instruction or management of training and development programs.	

DIFFERENCES IN "CLIENTS"

TRAINERS	TEACHERS
TRAINERS face enormous variety in the attributes of their "clients"	Teachers' "clients" are often more homogenous being segregated by
- in levels of education both between and within levels; - in salary ranges; - in levels of skill.	- age; - sex (sometimes); - social class; - educational ambitions.
TRAINERS have to make sure that their credibility is beyond question.	TEACHERS' credibility problems may often be created by the teacher.
e.g. The trainer often does not have a "subject" area. Trade instructors do. But the single training officer in a metal working organisation does not.	e.g. The teacher's competence in the subject area is taken for granted unless he is demonstrably incompetent.

RECOMMENDATIONS FOR ACTION

TRAINING IN INDUSTRY and TEACHING IN SCHOOLS

1. There appears to be little evidence that the work of trainers in industry differs greatly from that in government. Therefore one could advocate the Japanese model of easy movement of personnel from government to industry and industry to government.

2. Teachers are trained for three out of the five main roles of trainers i.e.

I - Planning and Preparation of Training Programs

II - Implementation of Training Programs

III - Professional Self-Development.

The other two roles, Research on, and Management of, training and development programs, can be developed by seconding suitable teachers to industry.

Conversely training and development personnel could be seconded to appropriate areas of post - primary and tertiary education.

Teachers need opportunities for industrial experience to be credible in industrial training.

Trainers need proper accreditation of job-relevant qualifications to be credible in schools and tertiary institutions as well as in industry.

RECOMMENDATION FOR RESEARCH

TRAINING IN INDUSTRY

1. There is a need to describe, analyse and evaluate

existing training programs in industry;

the criteria used to evaluate the performance of training and development personnel;

the match between the most important duties and tasks performed by groups of trainers and the educators programs for training and development personnel.

TEACHING IN SCHOOL

1. There have been many claims that teaching, especially in the post-primary sector, has changed greatly in the last 10 or 15 years. An analysis and description of the actual tasks performed by teachers is needed to provide objective information for those who need to design and evaluate teacher education programs at both pre-service and in-service levels.

2. The teaching practice programs need to be analysed and described accurately to ascertain how precisely the duties and tasks in the program match those encountered by beginning and experienced teachers in a period of change.

TERMS USED IN OCCUPATIONAL ANALYSIS

Case :	An individual responding to an occupational survey. (Other terms used are Job incumbent, Respondent)
CODAP :	Comprehensive Occupational Data Analysis Programs.
Duty :	A logical grouping of tasks.
Job :	What is actually performed by an individual.
Job Analysis :	The collection and analysis of information about jobs. (Also called Occupational Analysis)
Job Description :	A printout describing what is done by a group of respondents. e.g. Duty Job Description - Duties performed by at least one member, the per cent performing each, and the time spent on each. Task Job Description - Tasks performed by at least one member, the per cent performing each, and the time spent on each.
Job Type or Job Group :	A group of jobs which are more like each other than they are like any other group in the occupation being surveyed.
Task Inventory :	A survey instrument consisting of a list of significant tasks in the occupation being surveyed plus questions for obtaining background information.
Occupationl Analysis	The collection and analysis of information about jobs. (Also called job analysis).
Overlap	An index of the similarity between two jobs or groups of jobs. (Ranges from 0 to 100).

Tasks : The unit of work activity.

Task Statements : A sentence indicating the specific action taken in performing a task.

Variable : Background variable - A measurable quantity that may vary from one respondent to another.

Task variable - A measurable quantitly that may vary from one task to another.

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